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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/724,484	11/28/2003	Jun-Ku Han	45545.18.0	1033
7590	04/21/2006		EXAMINER HOANG, TU BA	
John F. Dolan Fredrikson & Byron, P.A. 4000 Pillsbury Center 200 South Sixth Street Minneapolis, MN 55402-1425			ART UNIT	PAPER NUMBER
			2832	
DATE MAILED: 04/21/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	<b>Application No.</b> 10/724,484	<b>Applicant(s)</b> HAN ET AL.	
	<b>Examiner</b> Tu Ba Hoang	<b>Art Unit</b> 2832	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 February 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2 and 4-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 November 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

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***Priority***

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

***Drawings***

Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-2 and 4-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Koyama (US 2005/0062581) cited in the previous Final Office Action. Koyama shows all features of the claimed invention including thermistor (Figures 4A, 4B, and 4C) comprising a resistance element 1 having a resistance varying characteristics according to changes of temperature or PTC element, first (12a) and second (13a) conductive layers formed on the upper surface of the element 1 (as shown in Figures 4A and 4C) where the first and second conductive layers 12a, 13a are adjacently engaged to each other with a non-conductive gap or distance interposed therebetween (page 4, paragraph [0056], lines 7-8), first (12b) and second (13b) electrodes formed on the lower surface of the resistance element 1 (as shown in Figures 4B and 4C) and electrically separated from each other by a gap or distance (i.e., adjacently engaged to each other with a non-conductive gap interposed therebetween) as shown in Figure 4B, a first and second connectors (1c and 1d) in which each is conductively electrically connecting the first conductive layer to the first electrode and connecting the second conductive layer to the second electrode respectively as shown in Figures 4E and 4F, wherein the first and second conductive layers and the first and second electrodes are arranged so that the first conductive layer and the second electrode face each other and

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substantially overlap each other with the element 1 interposed therebetween, and the second conductive layer and the first electrode face each other and substantially overlap each other with the element 1 interposed therebetween (as clearly shown in Figure 4C) with the non-conductive gap or distance has a shape of concave-convex pattern (i.e., diagonally zigzag, rectangular as clearly shown in Figures 4A and 4B), and if so desired, when voltages having opposite polarities are applied to the first and second electrodes, at least a current path can be formed between the adjacent first and second conductive layers via a region where the gap or distance is formed, formed between the adjacent first and second electrodes via the region where the gap is formed, formed between the first conductive layer and the second electrode via the element 1 disposed therebetween, and formed between the first electrode and the second conductive layer via the element 1 disposed therebetween, the PTC element 1 is a conductive polymer (as set forth in paragraph [0052]), the first and second conductive layers and the first and second electrodes are all made of copper or copper alloys (as set forth in paragraphs [0053]-[0054], i.e., copper strip), and the first connector electrically connects the first conductive layer to the first electrode via one side of the element 1, through hole 1c as clearly shown in Figure 4E, while the second connector electrically connects the second conductive layer to the second electrode via the other side of the element 1, through hole 1d as clearly shown in Figure 4F.

Claims 1-2, 4-8, and 10-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Huang et al (US 2003/0227731). Huang et al shows all features of the claimed invention including a thermistor 10 (Figure 1) comprising a resistance element 13 having a resistance varying characteristics according to changes of temperature or conductive polymer PTC element (paragraph [0033]), first (11B) and second (11A) conductive layers formed on the upper surface of the element 13 where the first and second conductive layers are adjacently engaged to each other with a non-conductive gap or isolation trench 17 interposed therebetween, first (12B) and second (12A) electrodes formed on the lower surface of the resistance element 13 and electrically separated from each other by a gap or isolation trench 19 where the electrodes are adjacently engaged to each other with the gap interposed therebetween, a first (22,24) and second (21,23) connectors (also see Figure 7, side connectors 113, 114) in which each is conductively electrically connecting the first conductive layer to the first electrode and connecting the second conductive layer to the second electrode respectively, wherein the first and second conductive layers and the first and second electrodes are arranged so that the first conductive layer and the second electrode face each other and substantially overlap each other with the element 13 interposed therebetween, and the second conductive layer and the first electrode face each other and substantially overlap each other with the element 13 interposed therebetween with the non-conductive gap 17 or 19 has a shape of concave-convex pattern (i.e., diagonally zigzag, rectangular, patterns as shown in Figures 1-4 and paragraph [0036]), and if so desired, when voltages having opposite polarities are applied to the first and second electrodes, at least a current path can be formed between the adjacent first and second conductive layers via a region where the gap or distance is formed, formed

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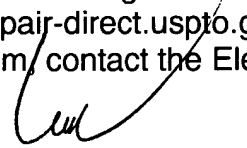
between the adjacent first and second electrodes via the region where the gap is formed, formed between the first conductive layer and the second electrode via the element 13 disposed therebetween, and formed between the first electrode and the second conductive layer via the element 13 disposed therebetween (paragraph [0032]), and the first and second conductive layers and the first and second electrodes are all made of copper or copper alloys (as set forth in paragraph [0034]), and at least the width of the gap or isolation trench is smaller than the thickness of the PTC element 13 (as visually shown in Figure 1).

Applicant's arguments with respect to claim filed 02/21/06 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tu Ba Hoang whose telephone number is (571) 272-4780. The examiner can normally be reached on Mon-Thu from 6:00AM to 6:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Elvin Enad can be reached on (571) 272-1990. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Tu Ba Hoang  
Primary Examiner  
Art Unit 2832

April 12, 2006